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Heart Failure Self-Care At Home

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Heart Failure Self-Care at Home

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Dedication

This DNP project is dedicated to my husband Hasan, son Gabriel, and daughter Lydia. Thank you for your love, prayers, support, and patience throughout this journey. This project is also dedicated to my mother Victoire. You are forever in my heart. You will always be my inspiration.

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Abstract

This evidence-based quality improvement project was implemented to improve self-care behaviors in homebound heart failure patients. Heart failure is a complex disease with significant challenges for patients, caregivers, healthcare providers, and the healthcare system. Educating and engaging patients in self-care management skills can reduce the clinical and financial burden of this disease. Heart failure self-care management skills can decrease 30-day readmission rates, improve quality of life, and reduce mortality. The self-care management program was implemented over a 6-week period. The Self-Care of Heart Failure Index (SCHFI) was administered at baseline to assess self-care and reevaluated after 6-weeks. During the first week, participants received heart failure education with individual counseling, followed by weekly telephone calls for four weeks. After completing the self-care management program, self-care maintenance increased to 29%, self-care perception increased to 39%, self-care management increased to 26%, and self-care confidence increased to 22%. The homebound heart failure program effectively improved self-care behavior scores in heart failure patients.

Keywords: heart failure, self-care management, patient education, homebound

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Chapter 1

Introduction

Heart failure is a chronic debilitating disease with significant challenges for healthcare providers, patients, and caretakers. Approximately 5.7 million American adults were diagnosed with heart failure from 2009 to 2012. According to cardiovascular statistical updates, the number of heart failure diagnoses increased to 6.2 million adults from 2013 to 2016. Further research estimates that the prevalence rate will rise to 8.5 million by 2030 (Benjamin et al., 2018). Heart failure is associated with poor health-related quality of life, rising healthcare cost, and increased mortality. For this reason, national and local efforts are being implemented to reduce the clinical and financial burden of this disease.

The transitional phase after hospital discharge is a crucial period where patients should receive comprehensive and coordinated care to prevent rehospitalizations. Heart failure patients in the community are normally managed by outpatient cardiology clinics. Older, disabled, and homebound patients are at risk for receiving fragmented care due to multiple risk factors/barriers. To improve health outcomes in cardiac patients, this quality improvement project will focus on addressing the needs of this population.

Background

Risk factors for poor health outcomes amongst this population are older adults with limited access to care, low health literacy, low socioeconomic status, language barriers, comorbidities, and polypharmacy (Silva & Krishnamurthy, 2016). Improving healthcare for heart failure patients requires an understanding of the barriers to access, delivery, and

resources. Healthcare services for heart failure patients are normally provided by hospitals or outpatient/ambulatory care clinics. Homebound heart failure patients tend to receive fragmented care because of difficulties leaving their homes to attend office-based visits. Furthermore, some heart failure patients are bedbound and require homecare visits by healthcare providers to ensure continuity of care and prevent loss to follow-up. These patients are considered vulnerable because of chronic medical conditions, frailty, ambulatory dysfunction, lack of transportation, and inadequate community resources. The increase in healthcare demand along with limited access to primary care or cardiology services results in unnecessary emergency room visits, hospitalizations, and downstream healthcare expenditures (Leff, Carlson, Saliba, & Ritchie, 2015). As a solution, a homebased heart failure self-care management program should be implemented in homebound patients to achieve target health outcomes.

Economic Impact

In 2012, the costs for hospitalizations and ambulatory care visits were $30.7 billion. According to the National Health and Nutrition Examination Survey (NHANES), this amount is projected to increase to $69.7 billion by 2030 (NHANES, 2016). Fitch, Engel, and Lau (2017) conducted a study by reviewing medical records and claims data from 2014 for heart failure patients. The investigators collected data from 5% of the Medicare population. The following metrics were reported:

1. 82.1% of patients were treated as inpatients. The average cost per admission was $11,840.

2. 11.6 % of patients were treated in emergency rooms without admission. The average cost per emergency room visit was $1,208.
3. 6.3% of patients were evaluated in observation units but not admitted. The average cost was $3,189 (Fitch et al., 2017).

Although the mortality rate from heart failure has significantly decreased, approximately half of the patients diagnosed with heart failure will die within five years of diagnosis (NHANES, 2016). According to the Agency for Health Care Quality and Research (AHRQ), hospital readmissions for this population are often preventable with post-discharge interventions such as home visits, patient and caregiver disease management education, and telephone support (AHRQ, 2015). The national observed 30-day readmission rate for Medicare beneficiaries due to heart failure between July 1, 2015 and June 30, 2018 was 21.6% (Center for Medicare and Medicaid Services, 2019). The complexity of heart failure management requires multidisciplinary care, educational support, and resources to achieve greater health outcomes.

Local Problem

In my current practice, chronic care disease management is provided through homecare services for heart failure patients that are unable to leave their homes. The home healthcare services are provided by three nurse practitioners. A review of the clinical workflow identified a lack of standardized heart failure self-care management program for this population. Patients usually receive verbal instructions on heart failure during routine visits. Achieving clinical stability requires knowledge of the disease process and self-care strategies. A self-care management program may benefit this population by improving their

quality of life. Other benefits include reduced hospitalization, decreased 30-day rehospitalization rate, and reduced mortality. Since homecare services are more patient-centric, these programs can provide more comprehensive and personalized care. At the organizational level, the benefits include improved documentation in the electronic medical record, increased reimbursement from insurance companies, compliance with national recommendations, coordinated and value-based care. The stake holders, including the medical director, homecare manager, and primary care healthcare providers support the implementation of this program to improve heart failure self-care disease management.

Self-care Management Programs

Due to the tremendous impact of this disease, patients are encouraged to participate in self-care management. According to Jonkman, Schuurmans, Groenwold, Hoes, and Trappenburg (2016), disease self-care management is a major component of preventing hospital readmissions and improving health outcomes. Self-care behaviors consists of daily activities to maintain clinical stability such as medication adherence, diet and exercise regimen, daily weight, symptoms recognition, and disease management. Patients who do not engage in selfcare behaviors are at risk for clinical deterioration, recurrent hospitalization, and increased mortality (Toukhsati, Driscoll, & Hare, 2015).

Heart failure self-care management programs are the gold standard of treatment for patients diagnosed with heart failure. Interventions are multifaceted and includes pharmacologic and nonpharmacologic interventions such as patient education, individual counseling, telephone follow-up, and telemonitoring. After discharge from the hospital, patient self-care management skills are the key to maintaining clinical stability at home. A

well-designed patient education program grounded in theory is essential for improving patient outcomes such as self-care ability and quality of life. Long-term outcomes of educational programs are reduced 30-day hospital readmissions, decreased healthcare cost, and decreased mortality (Boyde & Peters, 2014).

Research evidence supports the implementation of a nurse practitioner-led heart failure educational program to increase patient knowledge of disease process, improve self-care management skills, and increase patient and caretaker satisfaction. Heart failure programs may be delivered by face-to-face counseling, home visits, written materials, telephone follow-up, and remote monitoring. Although these programs have demonstrated improvement in patient outcomes, the results are often variable or inconclusive. The evidence is not clear on which educational modality is more effective to improve self-care behaviors in this population. For this reason, most published research studies utilized bundled interventions to achieve target outcomes for heart failure patients (Bryant & Himawan, 2019; Bryant & Gaspar, 2014; Ensign et al., 2015). This quality improvement project will address the following questions:

1. What are the main barriers preventing patients from performing self-care?
2. What are the unmet needs of heart failure patients which contributes to poor health outcomes?
3. What process measures or practice recommendations can improve heart failure disease management?

PICOT statement

"In homebound patients diagnosed with heart failure according to NYHA functional class I-IV, how does the implementation of a self-care management program compared to usual care (verbal instructions) affect self-care behaviors over a 6 -week period".

Self-care management programs can effectively reduce the clinical and financial burden of heart failure. Therefore, I propose implementing a quality improvement project to provide self-care management education for homebound patients diagnosed with New-York Heart Association (NYHA) functional classification I to IV.

Purpose/Aims

The purpose of the quality improvement project was to determine if a self-care management program will improve self-care behaviors in heart failure patients. Self-care behaviors was measured by the Self-care of Heart Failure Index v 7.2 (SCHFI) before and after the educational intervention. Patient outcomes was increased self-care behavior score by at least 20% between the baseline and final SCHFI questionnaire. Secondary long-term outcomes will be reduced emergency room utilization and reduced 30-day rehospitalization rates.

Chapter 2

Literature Review

This chapter provides a description of the theoretical framework and a review of the literature on heart failure self-care management programs. This review will be divided into the following sections: (a) definition of terms; (b) theoretical framework; (c) search strategies; (d) transition of care interventions; (e) bundled interventions; (f) homebased self-care management programs; (g) educational materials; and (h) impact of heart failure self-care management programs on patients, communities, and healthcare system.

Definition of Terms

Self-Care Management Programs

AHRQ defines self-care management support as the help provided to patients with chronic conditions which empowers them to manage their health on a day-to day-basis (2018). This process allows patients to assume ownership by taking an active role in managing their health. Self-care management goes beyond providing patients with education. In context, it involves the following:

1. Commitment to patient-centered care.
2. Providing patients with customized education and skills training.
3. Assisting patients in setting goals for healthier lifestyles.
4. Making referrals to community-based resources.
5. Following-up with patients through email, telephone, text messaging or mailing.

Heart Failure Education

According to AHA (2011), the goals of heart failure education are to provide patients and caregivers with the knowledge, skills, strategies, problem solving abilities, and the motivation needed to successfully perform self-care. The educational session should last at least 60 minutes or more . The education can be divided into multiple sessions, as long as 60 minutes or more was spent with the patient. Heart failure education can be delivered through various modalities such as face to face counseling, written materials, telephone support, and videos. This review seeks to identify the best approach to educate patients on self-care management to improve self-care behaviors. The following domains should be covered in the educational sessions (AHA, 2011):

1. Recognition of symptoms and concrete plan to effectively manage those symptoms.
2. Activity and exercise recommendations.
3. Medication adherence.
4. Importance of daily weight monitoring.
5. Modifying risk factors for heart failure such as smoking cessation, blood pressure control, and maintaining a normal Body Mass Index (BMI).
6. Follow-up appointments.

Homebound

The target population for this quality improvement project were homebound patients. According to CMS (2019), patients are considered homebound if they require assistive devices such as walkers, crutches, and wheelchairs. Additionally, patients must be unable to leave home or leaving home would worsen their medical condition (CMS, 2019). Heart failure patients are often certified as homebound due to advanced symptoms,

comorbidities, ambulatory dysfunction, and lack of social/community resources. Home self-care management programs may help patients and family members develop the skills and confidence needed to perform self-care activities.

Theoretical Framework

After reviewing the literature, the Situation-Specific Theory of Heart Failure Self-Care was selected as the theoretical model (Riegel, Dickson, & Faulkner, 2016).This theory was selected because it is more reflective of nursing practice, incorporates the diversity in patient phenomenon, and is limited to a specific population. The theory was originally published by Riegel & Dickson in 2008 but revised in 2010 to incorporate new knowledge about heart failure self-care.

In the revised theory, self-care is defined as a naturalistic decision-making process that encourages individuals to engage in activities to maintain physiologic stability. These actions allows the individual to recognize and directly manage their symptoms to reduce the risk of hospitalization (Riegel, Dickson, & Faulkner, 2016). The natural decision-making theory states, individuals are faced with daily decision making on self-care behaviors. The actions derived from this process are influenced by the interactions among the person, problem, setting, or environment. Person characteristics are age, gender, cognitive ability, health literacy, level of acculturation, and socioeconomic status. Problem characteristics may be comorbid conditions, polypharmacy, and physical limitations which complicates heart failure management. Environmental characteristics may be current living situation, social support, and external resources (Riegel et al., 2016). Therefore, self-care behavior is situation-specific.

This phenomenon may explain the variances in self-care behaviors amongst heart failure patients. Riegel et al. (2016) states, decisions about heart failure occurs daily and the naturalistic decision-making is used throughout the maintenance, symptom recognition, and management phase of the self-care process. Patients will make decisions based on knowledge, experience, and available resources. Self-care natural decision making is confounded by the interaction between the person, problem, and the environment.

Additionally, the revised theory involves three separate but linked concepts: maintenance, symptom perception, and management. The maintenance phase captures adherence to treatment plans and healthy behaviors. Target activities includes taking medications, engaging in physical activity, and following a sodium-restricted diet. Symptoms perception involves patients listening to their bodies, monitoring their symptoms, and identifying the signs and symptoms of acute heart failure decompensation. Self-care management involves patient response to symptoms whether it is autonomous or consultative.

Search Strategies

A comprehensive literature review was conducted to identify relevant research studies on improving self-care behaviors for heart failure patients. The search was focused on identifying, critically appraising, and synthesizing the literature to support the quality improvement project. The search engines used were PubMed, Medline, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). Key terms such as self-care, self-management, heart failure education, home visits, and outpatient were used. The selected time frame was 2014 to 2020. One article published in 2013 was selected because it was relevant to the topic and added a different perspective which was not studied in previous

research studies. Gray literature from AHA and AHRQ was selected to incorporate current practice guidelines in the review.

The search yielded 126 articles. Inclusion criteria for articles were scholarly, peer-reviewed, written in English, and had the full text available online. Articles that were focused on quality of life, heart failure knowledge, and health literacy were excluded from the review. The West Chester University Librarian was consulted to optimize search results. After applying the inclusion and exclusion parameters, 11 studies were selected for the literature review. The following themes were identified in the search: transition of care interventions, patient education with written materials, bundled interventions, and telephone support.

Transition of Care Interventions

The literature supports the use of transition of care interventions such as self-care management programs, home visits, telephone follow-up calls, medication reconciliation, inclusion of caregivers, and hand-off to post hospital primary care providers (Albert et al., 2015). The complexity of disease management requires a multifaceted approach to improve health outcomes, reduce 30-day hospitalization rate, and decrease the overall healthcare cost related to heart failure care. All 11 studies recommended patient education about the heart failure disease process, recognizing the signs and symptoms of heart failure, reducing dietary sodium intake, adhering to fluid restrictions, taking medications consistently, and attending follow-up visits with cardiologist (Al-Sutari & Ahmad (2017); Bos-Touwen et al., 2015; Boyde et al., 2018; Bryant & Gaspar, 2014; Bryant & Himawan, 2019; Clark et al., 2015; Ensign et al., 2015; Jurgens, Lee, Reitano, & Riegel, 2013; Sezgin, Mert, Özpelit, & Akdeniz, 2017; Srisuk, Cameron, Ski, & Thompson , 2016).

In a systematic review, researchers evaluated the effectiveness of heart failure self-care interventions on clinical events and symptoms burden (McGreal et al., 2014). The authors identified nine studies which employed heart failure education as the cornerstone of interventions. The interventions varied in educational content, frequency, and timing of information. Most of the studies used a heart failure booklet. One investigator created an audiotape for participants. Another investigator provided a DVD on self-care management skills. Eight out of the nine studies focused on one-to-one education. Patients were provided with instrumental tools such as weight scales, medication boxes, and measuring cups. Reinforcement of education were completed by home visits, telephone follow-up, and review of patient diaries. At the end of the review, the majority of educational interventions improved self-care scores. Also, the complexity of heart failure disease required more than patient education. Patients had different learning needs and preferences. The authors suggested implementing bundled interventions to meet the needs of this population (McGreal et al., 2014).

Bundled Interventions

Bundled interventions were effective at improving self-care behaviors in multiple studies (Al-Sutari, & Ahmad, 2017; Boyde et al. 2018; Bryant & Gaspar, 2014; Bryant & Himawan, 2019; Clark et al. 2015; Ensign et al., 2015; Jurgens et al. 2013; Sezgin et al. 2017; Srisuk et al. 2016). Some researchers evaluated the effectiveness of a heart failure educational program delivered by nurse practitioners to improve self-care behaviors and reduce hospitalizations (Bryant & Himawan, 2019; Ensign et al.,2015). Participants either received a scale and a 12-month calendar including patient education on self-care behaviors such as daily weights, adherence to medication regimens, and monitoring of symptoms (Bryant &

Himawan, 2019) or individual counseling along with review of the Krames " Living with Heart Failure" booklet (Ensign et al., 2015). Follow up sessions either occurred after three months and six months (Bryant and Himawan, 2019) or weekly for 5 weeks (Ensign et al., 2015).

Both studies utilized a pre/post study design and the SCHFI scale to measure heart failure self-care (Bryant & Himawan, 2019; Ensign et al., 2015). The results of the studies indicated statistically significant improvement in self-care behaviors and decreased hospitalization post interventions (Bryant & Himawan, 2019; Ensign et al., 2015). Despite the positive results, several limitations were identified in the results including a small sample size and potential provider bias (Bryant & Himawan, 2019).

Most of the studies in the literature review used a pre-and post-design but with relatively small sample sizes (Bryant & Himawan, 2019; Bryant & Gaspar, 2014; Ensign et al., 2015). In one such study (Jurgens et al., 2013) researchers evaluated the efficacy of HF-SMART, a heart failure symptom awareness and response training. Ninety-nine patients were eligible and recruited to participate in the study. The intervention group consisted of 48 patients and the control group consisted of 51 patients. This study reflected the challenges of implementing educational interventions for heart failure patients. Further research evidence suggests that multicomponent educational interventions are more effective at improving self-care behaviors than a single- educational intervention (Boyde et al., 2018; Clark et al., 2015; Sezgin et al., 2017; Srisuk et al., 2016).

A different perspective on heart failure disease management included somatic and cognitive awareness as part of the interventions (Jurgens et al., 2013). In somatic awareness,

patients focus on breathing patterns to determine if they are having any difficulty breathing or if symptoms are improving or deteriorating. Participants were asked to record their weight, symptoms, and fatigue on a laminated graph on card to track symptoms and their responses to these symptoms. The Heart Failure Somatic Scale is an 18 item, 6-point Likert scale to assess patient's awareness of heart failure symptoms and perceived distress (Jurgens et al., 2013). The interventions were completed by nurse practitioners and consisted of fewer visits than in previous studies (Bryant & Himawan, 2019; Ensign et al., 2015). Heart failure patients often misinterpret their symptoms which results in unnecessary emergency room visits. Education on somatic and cognitive awareness of symptoms may help patients recognize and respond appropriately to their symptoms. Reinforcement of educational materials and implementing intensive follow-up protocols may achieve sustainable results in the home care setting. Similar to the previous studies, this study was also limited by a small sample size and a lack of diversity (Jurgens et al., 2013). Despite these results, strong support exists for bundled interventions for heart failure patients.

Home Based Heart Failure Educational Program

Since the heart failure self-care management program was implemented in a home setting, the search criteria included articles which focused on homecare services (Bryant & Gaspar, 2014; Clark et al., 2015). Patients with a diagnosis of heart failure participated in a pre and post intervention design program including written educational materials on the cause of heart failure and self-care disease management actions (Bryant & Gaspar, 2014). Although this study identified a significant increase in patient self-care behaviors ($p < .01$), the sample size was too small to generalize findings.

Clark et al. (2015) employed similar research methods in a home-based study; however, memory enhancing methods were embedded into teaching materials and interventions. Additionally, researchers measured cognitive abilities through the Mini-Mental State Exam (MMSE) and the Metamemory in Adulthood (MIA) questionnaire. Self-care maintenance scores ($F = 7.24$, $df = 3, 46$, $p < .001$) and self-care confidence scores ($F = 6.70$, $df = 3,43$, $p = .001$) were significantly increased for the intervention group. Group differences in self-care management scores were analyzed using nonparametric statistics. The mean rank in the intervention group was 12.22 compared to 6.78 in the control group . Additionally, Clark et al. (2015) reported that the difference in rank was statistically significant (Mann Whitney $U = 16.00$, 2-tailed $p = .03$). The distinct methods used by Clark et al. (2015) highlight the importance of incorporating memory assessment and retention strategies into educational support to improve knowledge retention and increase self-care ability.

Educational Materials

The literature review identified multiple educational strategies to improve self-care behaviors amongst heart failure patients. Most research articles used information from the AHA (Boyde et al., 2018; Bryant & Gaspar, 2014; Bryant & Himawan, 2019; Jurgens et al., 2013; Sezgin et al., 2017; Srisuk et al.,2016) or Krames “Living with Heart Failure” booklet (Ensign et al., 2015). However, no evidence of standardization on the use of educational materials was retrieved.

Recommendations for educational strategies to improve patient outcomes, should be grounded in theory and include contemporary evidence (Boyde & Peters, 2014). Educational interventions should be straightforward, standardized, and practical. The

information provided to patients should also be in agreement with current practice guidelines. In multiple studies, the timing, frequency, and sessions varied which presented a challenge in identifying which modality was more effective (Boyde et al., 2018; Clark et al., 2015; Sezgin et al., 2017; Srisuk et al., 2016).

Albano et al. (2014) attributed the challenges of comparing, reproducing, and generalizing study results, to the lack of precisely described educational programs and consistent outcome reporting. Furthermore, the educational needs of heart failure patients are complex and multifaceted. The evidence is clear that patient educational interventions supplemented with a heart failure manual are effective at improving self-care behaviors with or without telephone follow-up (Bos-Touwen et al., 2015; Boyde & Peters, 2014; Bryant & Himawan, 2019; Ensign et al., 2015; McGreal et al., 2014).

Evidence suggests that heart failure management programs provide a broad range of information on heart failure disease process, lifestyle modifications, adherence to nonpharmacological or pharmacologic treatment plans, and self-care behaviors (Bos-Touwen et al., 2015; Boyde et al., 2018; Boyde & Peters, 2014; Bryant & Gaspar, 2014; Bryant & Himawan, 2019; Ensign et al., 2015; Jurgens et al.,2013; McGreal et al., 2014; Sezgin et al., 2017; Srisuk et al., 2016). However, patients must be motivated and involved in their own learning to achieve health outcomes. The content of educational materials should be tailored to the needs of the patient with consideration of literacy level, cognitive ability, and socioeconomic factors (Bos-Touwen et al., 2015; Boyde & Peters, 2014; McGreal et al., 2014). Krames “Living with Heart Failure” booklet was selected for this

quality improvement project because the information reflects current practice guidelines and is published on behalf of the AHA (Krames, 2019).

Patient-Centered Care

Patient-centered care allows the clinician to focus on what matters the most to the patient. Heart failure educational materials should be standardized but the delivery of the information should be tailored to the learning needs of the patient. In a study by Ross, Ohlsson, Blomberg, and Gustafsson (2015), study participants were asked to write down their learning needs before the educational intervention. This process ensured that patients were receiving customized education. Patients in the intervention group felt more confident that the information they received was more correlated with their personal situations. This method has the potential to improve heart failure management and facilitate patient-centered care (Ross et al., 2015).

Research Gaps

There are very few studies on homebound patients receiving self-care management support. Most of the studies were focused on hospitalized and outpatient cardiology patients, despite recent statistics that note the presence of approximately four-million adults in the United States who are homebound and unable to assess office-based primary care services (Leff et al., 2015). The cost of healthcare for this population remains high due to a combination of multiple chronic conditions, functional limitations, frailty, and socioeconomic factors. Unmet healthcare needs and limited access to primary care services result in frequent emergency room visits, hospitalizations, and increased healthcare expenditure. For this reason, healthcare providers should continually review the literature and implement evidence-based quality programs for this subset of the population.

Additional research should be conducted on the most effective methods to provide self-care management support for homebound heart failure patients.

In reviewing the literature, it was difficult to determine which educational strategy was more effective to improve self-care behaviors. Multiple learning modalities were implemented but study results could not identify whether one-to-one counseling compared to telephone follow-up was more effective (Boyde et al., 2018; Boyde & Peters, 2014). Lastly, there is a lack of standardization in heart failure educational.

Summary

The literature review provides compelling evidence on the use of educational booklets to provide information on disease prevention, pharmacologic/nonpharmacologic interventions, and self-care behaviors. Educational materials allow the patient to learn and retain the information over time and at their own pace. The patient can also use the booklet for ongoing reference. Studies that utilized written materials along with verbal instructions were more successful at improving self-care behaviors (Ensign et al., 2015; L-Sutari & Ahmad, 2017).

Patients with heart failure require education to perform self-care behaviors. Self-care strategies empower patients to take responsibility for their own health and make decisions to prevent clinical events. Self-care involves daily symptom monitoring, symptom recognition, and knowledgeable decision-making on how to manage symptoms when they occur (Jurgens et al., 2014). The literature supports the implementation of a nurse practitioner-led heart failure educational program to improve self-care behaviors (Bryant & Gaspar, 2014; Bryant & Himawan, 2019; Ensign et al., 2015). Additionally, patients normally receive

educational interventions in the hospital or during follow-up at cardiac outpatient clinics, but there continue to be few studies on heart failure education in home settings.

Heart failure programs may be delivered by face-to-face counseling, home visits, written materials, telephone follow-up, and remote monitoring. Although these programs are effective at improving patient outcomes, the results are often variable or inconclusive. Also, despite receiving educational support on heart failure, patients often report a lack of knowledge of disease process and self-care behaviors. The best method for promoting self-care behaviors should be straightforward, practical, and standardized with consideration of health literacy and cultural differences (McGreal et al., 2014). Most studies in the review utilized a multicomponent approach to improve self-care behaviors. Patients have different learning needs and requires customized, cultural, and literacy-sensitive education. Although the literature review was not focused on hospital readmissions, mortality rates, or healthcare related quality of life, there was a positive correlation between self-care management programs and improvement in patient outcomes (Bryant & Gaspar, 2014; Ensign et al., 2015). This finding is significant for clinical practice. Nurse practitioners can use clinical and systems leadership skills to develop programs and implement practice guidelines for heart failure patients. Overall, the literature review supports the implementation of self-care management programs by nurse practitioners to improve self-care behaviors in heart failure patients.

Chapter 3

Methods

The quality improvement project used a quasi-experimental pretest and posttest design to evaluate the effectiveness of a heart failure self-care management program. A pretest and posttest design is a great approach to determine causal inferences between the dependent and independent variable. Utilizing this method, data was collected for the same subject before and after the intervention. Therefore, participants served as their own control.

After completing a needs assessment, it was determined that Excel Medical Center should implement a standardized heart failure educational program for homebound patients. The risk for hospitalization and poorer health outcomes are increased in this population due to lack of knowledge of self-care management skills and unmet healthcare needs. Other identified vulnerabilities are older age, comorbidities, homebound status, ambulatory dysfunction, and lack of caregiver support /community resources. Since all participants may benefit from the intervention, it was unethical to withhold treatment from a particular group. For this reason, subjects were not randomized. The educational program was offered to all qualified participants. Quasi-experimental designs are normally use in field settings when randomization may be difficult or impossible (Price, Chiang, & Jhangiani, 2015). Therefore, this research design is appropriate for the quality improvement project.

Setting

Excel Medical Center is a primary care clinic in Philadelphia county. The organization operates eight clinics throughout the Philadelphia region in underserved and low-income communities. Philadelphia county is the most populous county in Pennsylvania.

Philadelphia covers 134.10 square miles with a population of 1,584,138 people. In 2018, population census were recorded as 42.6 % black, 41.6% white, 0.4% American Indian or Alaskan Native, 7.1 % Asian, 14.1% Hispanic, 0.1 % Native Hawaiian or Pacific Islander, and 2.8 % two or more races present (U.S. Census Bureau, 2018). The median household income between 2013-2017 were $40,649. An estimated 25.8% of residents are living in poverty (Data USA, 2019). Additional population demographics are included in Figures 1, 2, and 3.

The physicians, nurse practitioners, and physician assistants provides primary care services at clinic locations for ambulatory patients and homecare visits for homebound patients. The mission of this organization is “Striving for a Healthier Community”. Organizational goals are to heal, educate, and provide quality care for the community (Excel Medical, 2019).

Homecare services are provided primarily by three nurse practitioners in collaboration with the medical director. There are approximately 330 patients in the homecare database with varying diagnoses. The stakeholders with vested interest in the outcomes of this project includes: the medical director, homecare manager, project team members, ancillary staff, patients, and caregivers. The homecare manager was instrumental in moving the project forward by providing access to patient data, homecare supplies, and support personnel.

Sample Characteristics

The quality improvement project used a convenience sample of homebound patients diagnosed with heart failure from the homecare database. The main issue with convenience

sampling is that each subject in the target population are not guaranteed a chance to participate in the study. Therefore, a nonprobability sampling method may limit the generability of study results (Elfil & Negida, 2017). On the other hand, convenience sampling is the most appropriate approach for this project because of its feasibility and convenience.

A chart audit was completed to identify patients diagnose with heart failure. Inclusion criteria were: NYHA functional class I-IV, ability to speak English, and currently receiving homecare services. Patients with decompensated heart failure, Implantable Cardioverter Defibrillator (ICD), and pacemakers were excluded from the project. After identifying potential participants in the homecare database, the nurse practitioner contacted the patients by telephone. This process was the primary method of recruitment. Recruitment efforts such as flyers and advertisements were limited for this population because of the homebound status. A copy of the telephone script is included in Appendix C.

A paired t-test was used for the statistical analysis. Using the G* power software to conduct a *priori* power analysis with a power of 0.80, alpha 0.05, and a moderate effect size of 0.5, it was determined that a sample of 28 patients is needed to achieve statistical significance.

Ethical Approval and Consent

Institutional Review Board (IRB) approval was obtained from West Chester University (Appendix D). Excel Medical did not require a separate IRB approval. Original consent forms and surveys were stored separately in a locked cabinet. Participants were provided with unique identifiers which consisted of their birth year, mother's first initial,

and father's first initial. The questionnaires (Appendix B) were hard copies instead of digital. Consent forms (Appendix A) and hard copy questionnaire data will be destroyed in May 2023. Any additional data will be stored in a laptop secured with a password and will also be destroyed in May 2023.

Data Collection

Data was collected by the principal investigator and one nurse practitioner. The nurse practitioner received training on the study protocol and data collection process. Demographic data such as age, gender, race, NYHA functional class, and number of comorbidities was collected and entered into an Excel spreadsheet. During the initial homecare visit, participants signed the consent form and completed the baseline SCHFI scale. After completing the questionnaires, the nurse practitioner reviewed the heart failure booklet, provided counseling, and addressed any questions or concerns. Participants received weekly telephone calls for 4 weeks to reinforce patient education and answer any questions. After six weeks, the nurse practitioners completed the final homecare visit and the post-intervention SCHFI scale. The homecare visits and interview sessions were not recorded to maintain patient privacy and confidentiality.

The SCHFI scale (7.2) (Riegel et al., 2019) (Appendix B) has been frequently used in research studies since it was originally published in 2004. This tool has been updated to reflect the evolution in knowledge of heart failure self-care and disease management. The SCHFI instrument was selected for this quality improvement project because it was designed to specifically measure the different components of self-care in heart failure patients.

The revised SCHFI (v7.2) consisted of 29 items divided into three scales: self-care maintenance, symptom perception, and self-care management. Each category of the SCHFI scales uses a likert-type response option. When analyzing the data, each scale is scored separately. Response choices for all items in the scale are summed up to achieve a possible score of 0 to 100. Higher scores indicate better self-care. A score of 70 or better indicates an adequate level of self-care.

Psychometric testing of the SCHFI (v7.2) scale (Riegel et al. 2019) included a Cronbach [Alpha] score for each scale independently, and a reliability coefficient of (0.71) for self-maintenance, (0.81) for symptom perception, and (0.66) for the self-care management scale which was inadequate for statistical significance. Furthermore, since each scale has two dimensions, the authors decided to use the global reliability index for multidimensional scales. The reliability coefficient scores were significantly improved: self-care maintenance (0.75), symptom perception (0.85), and self-care management were adequate at (0.70). Test- retest reliability was 0.89 for self-care maintenance, 0.70 for symptom perception, and 0.84 for self-care management. Predictive validity was well supported with correlations between the SCHFI (v.72) and the 36-item Short Form Survey (SF-36). SF-36 is an instrument that measures health-related quality of life. Participants with better general health had higher self-maintenance scores and higher symptom perception scores. No relationship was found between self-care management and health-related quality of life. The SCHFI scale is a valid and reliable tool to measure the components of self-care in heart failure patients (Riegel et al., 2019).

Planning

The DNP candidate served as the project leader. Additional members of the team included the medical director, homecare manager and the nurse practitioners who provide the homecare services. A statistician was consulted before and throughout the project to assist with data analysis.

An initial planning meeting was conducted with the homecare manager and one of the nurse practitioners. It was determined that the project is feasible and will be supported by other key stakeholders. The need for educational materials and other resources were discussed. A budget plan along with a SWOT analysis was presented to the homecare manager. Potential barriers such as logistics, organizational policies, staff resistance to change, and loss to follow-up were reviewed. Shareholders were provided with detailed information on recruitment strategies, patient incentives, IRB process, and sustainability of interventions.

Implementation

A review of 330 charts was conducted over a 2-week period. After applying the inclusion and exclusion criteria, the remaining patients were contacted by telephone. During the initial contact, potential participants were provided with information on the project. An initial homecare visit was scheduled for participants who agreed to participate in the study.

During the initial homecare visit, participants signed the consent form and completed the pretest. The nurse practitioner reviewed the Krames " Living with Heart Failure" booklet and provided individual counseling. The meeting lasted approximately 60 minutes. Upon completion of the educational program, the goal of improve heart failure self-care behaviors was accomplished through the following objectives:

1. Participants learned how to monitor blood pressure and heart rate.
2. Participants recorded their daily weight.
3. Participants recorded amount of fluid consumed during the day.
4. Long-term goals will be improved self-care behaviors and reduced 30-day rehospitalization due to heart failure.

Timeline

The heart failure quality improvement program was implemented during a 6-week period. This time frame was used for recruitment, implementation of intervention, and data collection (Table 4). An additional 6 weeks was used for data analysis, evaluation, and reporting of results.

Budget

The expenses for the heart failure quality improvement project included funds needed to purchase the Krames "Living with Heart Failure" booklet, weight scales, medication organizers , and blood pressure cuffs. The final cost for supplies was determined to be $5490.30 (Table 3). Additional supplies were purchased to sustain the educational program after the quality improvement project is completed.

After completing the project, each participant received a $20 gift card towards fruits and vegetable. A total of 12 VISA gift cards were purchased. The total cost for the gift cards plus the activation fees were $324.00.

Barriers and Challenges

A major challenge during the implementation of the project was the global Corona Virus (COVID-19) pandemic. Approximately 122, 653 cases and 2,112 deaths have been

reported in the United States (Center for Disease Control, 2020). In the Philadelphia region, 890 cases and 8 fatalities have been reported. These numbers are expected to increase as more patients in the community are infected and tested (Philadelphia Department of Public Health, 2020). To limit the spread of this highly contagious virus, Pennsylvania Governor Tom Wolf and Philadelphia Mayor Jim Kenney instituted stay-at-home orders for residents, social distancing recommendations, cancelling of public gatherings, and limiting nonessential services. Additionally, shortages of protective equipment for first responders and healthcare workers have been reported throughout the Commonwealth. As a result, some of the final home visits had to be modified for patient and staff safety. Two of the participants were experiencing mild upper respiratory symptoms and were confined to their homes. As a result, I conducted the final home visit while standing outside their homes on the telephone with the patient. All questions and concerns were addressed during the telephone call.

Data Analysis

According to Rowe (2015), a paired t-test is the best method to compare two related sets of measurements. This test is appropriate when the same subject is being measured under two different circumstances such as before and after the intervention (Rowe, 2015, p. 168). The purpose of the test is to determine whether the mean difference between two sets of measurements is zero. This quality improvement project compared the data obtained from both the pretest and posttest for each subject. The intervention was administered between the two time points.

Data analysis followed the processes outlined by Bannon (2013). Prior to entering the data into the Statistical Package for Social Sciences (SPSS, version 26) software for

statistical analysis, the data was coded, cleaned, and recoded. The collected data was organized into an Excel spreadsheet to facilitate the process.

Chapter 4

Results

This chapter presents the results of the data analysis, including the results of the baseline SCHFI questionnaires and telephone follow-up. A chart audit of the homecare database was conducted over a 2-week period. A total of 330 charts were reviewed to identify heart failure patients. After applying the inclusion and exclusion criteria, 25 patients were contacted by telephone and invited to participate in the educational program. A total of 15 patients agreed to participate in the study for a response rate of 75%. One patient declined to participate after the screening process. Two patients did not want any home visits and therefore were removed from data analysis leaving a sample of 12 patients. One participant dropped out of the program after 4 weeks for unknown reasons.

Demographic data such as age, race, gender, NYHA functional class, and number of comorbidities were collected at the beginning of the review. Preexisting diagnosis of anxiety and depression may affect readiness to learn and motivation to participate in self-care. Therefore, this information was included in the demographic data. After the recruitment process was completed, a home visit was scheduled with potential participants.

Initial home visits were conducted on January 27, 2020, February 1, 2020, and February 5, 2020. The initial interview lasted approximately 60 minutes. After signing the consent form, participants completed the baseline SCHFI scale and received individual education and counseling with the Krames heart failure booklet. At the end of the intervention, each participant received a scale, a blood pressure cuff, and a medication reminder box. Participants were told that they would receive weekly telephone calls for 4 weeks as part of the educational intervention.

A data dictionary was created to organize and code the results of the questionnaires. After coding and entering the data into the SPSS software, the value 777 was entered into the missing column to indicate missing value. Refused items were coded as 888, and not applicable items were coded as 999. Data cleaning was conducted by referencing the responses from the hard copy questionnaires to the data entered into the SPSS database. Next, each variable was examined by running a frequency procedure to check for inappropriate or invalid responses.

SPSS was used for statistical analysis. The data analysis plan was conducted in three phases. First, all study variables were presented using descriptive statistics, such as, means, standard deviation, and minimum/maximum values for continuous variables (Interval/Ratio level) and frequencies and percentages for categorical variables (Nominal/Ratio level).

Next, a series of bivariate tests were used to produce inferential findings. Specifically, a paired-samples t-test was used to identify if pretest to posttest difference scores changed at a statistically significant level ($p<.05$). Next, pretest to posttest difference scores were computed through subtracting pretest scores from respective posttest scores. Bivariate tests

were then used to identify if pre/post change scores were related to study participant age (via Pearson's r correlation), as well as gender and racial/ethnic identity (via independent-samples t-test), and history of anxiety and depression at a statistically significant level. Demographic characteristics related to pretest to posttest changes at a statistically significant level ($p<.05$), will be included in the third phase of analysis, multivariate analysis. The third phase of data analysis involved a multivariate model, specifically a repeated measures general linear model. This method was used to model pretest to posttest change in matched paired scores while controlling for the effect of demographic data.

Within the final inferential analysis presented, the parametric test assumptions of normality, linearity, and no undue influence of outliers were examined and revealed no significant problems. Regarding missing data, one of the original study participants failed to provide posttest scores and was excluded from the analysis, leaving the 11 study participants included in the study. Otherwise, there were complete data for all analysis, so there was no further need to address missing values. In terms of statistical power for the paired-samples t-test, the G*power software indicated that a large size effect (Cohen's d=1.00) between the related means within the paired-samples t-test (2-tailed) with power set at .80 and alpha set at .05, would require a sample size of 10 study participants. Thus, the current sample of 11 study participants would provide sufficient statistical power for the current analysis.

Descriptive Analysis

Table 5 presents a descriptive analysis of study participant demographic characteristics. Data indicated that the sample was about half female (n=6; 54.5%), predominantly of a Black racial/ethnic identity (n=8; 72.7%) and had an average age of 72.55 (SD=11.78, MIN/MAX=56-89) years. About half the sample reported having a history of

anxiety (*n*=6; 54.5%), while over three-quarters reported a history of depression (*n*=8; 72.7%). Over three-quarters of the sample reported a NYHA functional class of 3 (*n*=8; 72.7%). The most prevalent comorbidity reported was 9 (*n*=4; 36.4).

Table 6 presents a descriptive analysis of the pretest to posttest difference scores. Mean difference scores included 11.27 (SD=8.68, MIN/MAX=0.00-29.00) for self-care confidence, 10.73 (SD=4.63, MIN/MAX=1.00-19.00) for self-care management, 17.00 (SD=9.76, MIN/MAX=6.00-31.00) for self-care perception, 12.91 (SD=7.80, MIN/MAX=2.00-31.00) for Self-Care Maintenance, and 51.91 (SD=26.14, MIN/MAX=13.00-97.00) for the total SCHFI. The distribution of all the scores were approximately normal as the skewness and kurtosis were not approximately two times each respective standard error of each.

Bivariate Analysis

Table 7 presents a paired-samples t-test examining the changes in pretest to posttest scores. Bivariate analysis indicated that self-care confidence increased from pretest (*M*=36.27, *SD*=10.00) to posttest (*M*=47.55, *SD*=3.56) at a statistically significant level, *t*(10)=-4.31, *p*<.01, with a large effect size (Cohen's *d*=-1.50). Additionally, analysis indicated that self-care management increased from pretest (*M*=27.27, *SD*=4.47) to posttest (*M*=38.00, *SD*=1.48) at a statistically significant level, *t*(10)= -7.69, *p*<.001, with a large effect size (Cohen's *d*=-3.22). Further analysis indicated that self-care perception increased from pretest (*M*=35.18, *SD*=11.40) to posttest (*M*=52.18, *SD*=2.82) at a statistically significant level, *t*(10)= -5.78, *p*<.001, with a large effect size (Cohen's *d*=-2.05). Furthermore, analysis indicated that self-care maintenance increased from pretest (*M*=31.55, *SD*=7.75) to posttest (*M*=44.45, *SD*=4.06) at a statistically significant level, *t*(10)= -5.49,

$p<.001$, with a large effect size (Cohen's $d=-2.09$). Finally, analysis indicated that total SCHFI increased from pretest ($M=130.27$, $SD=29.23$) to posttest ($M=182.18$, $SD=7.49$) at a statistically significant level, $t(10)= -6.59$, $p<.001$, with a large effect size (Cohen's $d=-2.43$).

Table 8 presents a Pearson's r correlation examining the relationship between age and pretest to posttest difference scores. The 2-tailed correlation indicated that higher age was related to lower pre/post difference scores reflecting self-care maintenance at a statistically significant level, $r(9)=-.70$, $p<.05$. Pearson's r correlations also indicated that age is not significantly related to the pretest to posttest difference scores.

Table 9 presents an independent samples t-test analysis of pretest to posttest difference scores by gender. Data indicated that difference scores did not differ significantly by gender for scores reflecting self-care confidence, $t(9)=-1.08$, $p=.31$, self-care management, $t(9)=-.20$, $p=.84$, self-care perception, $t(9)=.00$, $p=1.00$, self-care maintenance, $t(9)=.56$, $p=.59$, and total SCHFI, $t(9)=-.21$, $p=.84$. An independent samples t-test analysis of pretest to posttest difference scores by racial identity was conducted. Data indicated that difference scores did not differ significantly by racial identity for scores reflecting self-care confidence, $t(9)=-.95$, $p=.37$, self-care management, $t(9)=.16$, $p=.87$, self-care perception, $t(9)=-.26$, $p=.80$, self-care maintenance, $t(9)=-.98$, $p=.36$, and total SCHFI, $t(9)=-.66$, $p=.53$. These findings are presented in table 10

Table 11 presents an independent samples t-test analysis of pretest to posttest difference scores by history of anxiety. Data indicated that difference scores did not differ significantly by history of anxiety for scores reflecting self-care confidence, $t(9)=-.24$,

p=.82, self-care management, *t*(9)=.08, *p*=.94, self-care perception, *t*(9)=-.24, *p*=.82, self-care maintenance, *t*(9)=.04, *p*=.97, and total SCHFI, *t*(9)=.14, *p*=.89.

Table 12 presents an independent samples t-test analysis of pretest to posttest difference scores by history of depression. Data indicated that difference scores did not differ significantly by history of depression for scores reflecting self-care confidence, *t*(9)=.51, *p*=.62, self-care management, *t*(9)=.16, *p*=.87, self-care perception, *t*(9)=.54, *p*=.61, self-care maintenance, *t*(9)=.31, *p*=.77, and total SCHFI, *t*(9)=.49, *p*=.64.

Multivariate Analysis

Table 13 presents repeated measures general linear model examining pretest to posttest self-care maintenance score changes while controlling for the effect of study participant age (as study participant *age* is the single demographic variable related to a pretest to posttest difference score, specifically, self-care maintenance). Multivariate analysis indicated, that while including study participant age as a covariate, changes in pretest (*M*=31.55, *SD*=7.75) to post (*M*=44.45, *SD*=4.06) scores self-care maintenance remained statistically significant, *F*(1, 9)=16.27, *p*<.05. Furthermore, the analysis evidenced a large Partial Eta Squared effect size of .64.

Results of the Baseline SCHFI Survey

Self-care behaviors which includes self-care maintenance, self-care perception, self-care management, and self-care confidence were measured on a 5-point likert scale. Riegel et al. (2019) recommends measuring each scale separately. Self-care maintenance consisted

of 10 questions with a range of 1 = never and 5 = always, including a middle neutral option. The questions on the self-care maintenance category were focused on getting exercise such as taking a brisk walk or using the stairs, frequency of seeing healthcare provider, taking medicines as prescribed without missing a dose, eating a low salt diet or requesting low salt foods when ordering out. Results of the self-care maintenance category indicated that 50% of patients do not exercise or routinely take the stairs, 41.7% of patients do not monitor their salt intake, 75% of participants always take their medicines, and only 16.7% of patients use a system to organize their medicines.

Self-care perception category contained nine questions specifically asking participants how often they monitor their daily weight, check their ankles for swelling, monitor closely for symptoms, or check for shortness of breath while performing Activities of Daily Living (ADL). Data analysis indicated that 83.3 % of participants do not monitor their weight daily, 33.3% do not check their ankles for swelling, 16.7% do not monitor their symptoms, and 25% do not check for symptoms while performing ADL's.

The self-care management category contained eight questions on how participants responded to their symptoms. Participants were asked about the likelihood of limiting their daily salt intake , reducing their fluid intake, limiting activity, or taking a medicine when heart failure symptoms occurred. Responses ranged from 1 = not likely to 5 = very likely. The results indicated that 41.7% of participants were not likely to limit their salt intake based on heart failure symptoms. Participants were more likely to take a medicine (50%) or limit their activity (50%) when heart failure symptoms occurred.

The final category was focused on self-care confidence. Participants were asked whether they are not confident, somewhat confident, or extremely confident in their ability to follow the prescribed treatment plan, remain stable and free of symptoms, and do something to relieve their symptoms. The results indicated that 50% of patients were extremely confident in their ability to remain symptom free, 25% were extremely confident in their ability to follow the treatment plan, and 41.7% were extremely confident in their ability to do something to relieve their symptoms.

Results of the Post-SCHFI Survey

Results of the self-care maintenance category after the self-care management program indicated that 33% of participants did not exercise or routinely take the stairs compared to 50% in the pre-survey. Approximately 8.3% of participants did not monitor their salt intake compared to 41.7% in the pre-survey. Also, 91.7% of participants always take their medicine, and most participants 91.7% used a system to organize their medicines. The postscores significantly increased after the educational program. Data analysis for the self-care perception category indicated that 75 % of participants monitor their weight daily, 83.3% always checked their ankles for swelling, 91.7 % monitor their symptoms closely, and 83.3% always check for symptoms while performing ADL's. For the self-care management category, more participants 58.3% were more likely to limit their salt intake based on heart failure symptoms. Participants were more likely to take a medicine 91.7% or limit their activity 83.3% when heart failure symptoms occurred.

Data analysis for self-care confidence indicated that 66.7% of patients were extremely confident in their ability to remain symptom free, 58.3% were extremely confident in their ability to follow the treatment plan, and 75% were extremely confident in their ability to do

something to relieve their symptoms. The minimum score for the baseline SCHFI survey was 79 and the maximum score was 175. Additionally, the minimum score for the post SCHI survey was 168 and the maximum score was 191.

Anxiety and Depression

Anxiety and depression was a common diagnosis amongst participants. Seven patients were diagnosed with anxiety, nine patients were diagnosed with depression, and seven patients were diagnosed for both. These results are important to assess for readiness and motivation to learn.

Project Evaluation and Outcomes

Multiple barriers were encountered during the implementation of this quality improvement project. First, the homecare database was outdated and not reflective of current patient volume. Some of the patients listed in the database were deceased or were no longer with the practice. Additionally, the Electronic Medical Record (EMR) does not contain any specific filters to isolate patients with heart failure diagnosis. As a result, individual chart audits were conducted to identify active patients under treatment for heart failure. The homecare manager and other team members also referred patients that met the eligibility criteria for the project.

The sample population were mostly older adults with decreased visual acuity and comorbidities. Multiple participants complained that the survey was too long and needed assistance to complete it. At least three participants suffered from ambulatory dysfunction and had difficulty standing on a scale to monitor their weight. To solve this issue,

participants were provided with additional information on other methods to monitor for volume overload. One participant weighed more than 400 lbs. which was beyond the capacity of the scale. Future quality improvement projects should include bariatric scales for morbidly obese patients.

Chapter 5

Discussion

Clinical management of heart failure presents significant challenges for patients, caregivers, healthcare providers, and healthcare systems. National healthcare policies and recommendations are being implemented to reduce the clinical and financial burden of this disease by focusing on outcome measures such as: mortality, patient safety, hospital readmission, patient experience, and quality care. Previous research highlights the benefits of APRN- led self-care management programs to improve selfcare behaviors in heart failure patients. Patients with adequate selfcare-management skills can effectively prevent, recognize, and manage their symptoms at home to reduce costly emergency room visits and hospitalizations.

This quality improvement program sought to determine if a self-care management program could effectively improve self-care behaviors in homebound patients compared to usual care such as verbal instructions. Key elements of self-care management programs were identified as: educating patients on daily weight, taking medications consistently, increasing activity, exercising regularly, measuring blood pressure, recognizing the symptoms of heart failure, and effectively managing those symptoms. Key findings include patients' individual learning needs and preferences, which should be assessed prior to implementing any educational interventions. Secondly, verbal instructions alone cannot effectively improve self-care behaviors. To promote the adaptation of self-care management skills into their daily routine, patients and caregivers need ongoing educational reinforcement through written educational manuals, telephone support, individual

counseling, and interval follow-up. For this reason, self-care management programs should include bundled interventions that incorporates all the aforementioned components. Another key finding was the importance of addressing the physical, social, financial, and cultural barriers that prevent patients from participating in self-care activities. Addressing those barriers requires an interdisciplinary team approach to include the APRN primary care provider, registered nurse, physical therapist, occupational therapist, social worker, and nutritionist. This quality improvement project contributes to the literature by highlighting the role of the APRN in utilizing organizational and system leadership skills to improve clinical practice.

Discussion of Results

The sample for this quality improvement project were half females (n=6; 54.5%) predominantly of a Black racial/ethnic identity (n=8; 72.7%) and had an average age of 72.55 (SD=11.78, MIN/MAX=56-89) years. Patients were recruited from predominantly African-American neighborhoods. The most significant finding in patient demographics was the presence of multiple comorbidities which further confounds heart failure management. Demographic data such as NYHA functional class was included in the data analysis. Eight patients were diagnosed with NYHA class 3, and four patients were diagnosed with NYHA class 4. The significance of this finding suggest that patients had advanced disease and symptoms which may limit participation in self-care behaviors. This finding highlights the importance of intensive patient education and participation in self-care management programs after the initial diagnosis of heart failure to prevent clinical deterioration.

All participants had underlying hypertension and other comorbidities. Since uncontrolled hypertension is a risk factor for the development of heart failure, future research should focus on self-care management education for patients diagnosed with hypertension to prevent end-organ damage. This approach might reduce the clinical and financial burden of heart failure by intervening at the early stages of the disease process compared to the advanced stages, which requires complex care and more healthcare resources.

Participants were provided with the following instruments: scale, blood pressure cuff, heart failure booklet, and a medication organizer box. Results of the self-care maintenance category in the baseline SCHFI scale indicated that 50% of patients did not exercise or routinely take the stairs. Most of the patients in the study were diagnosed with ambulatory dysfunction, and therefore, were unable to participate in regular activities. To address this issue, participants were encouraged to slowly increase their activity with assistance/ambulatory aid. Participants were provided with modified exercises that could be completed at the bedside or while sitting in a chair. Physical and occupational therapy referrals were provided to assist with mobility issues. After the intervention, only 33% of patients reported not exercising routinely in the post SCHFI survey ($p < .001$). This finding suggests that patient education on increasing activity was effective. Approximately 8.3% of participants did not monitor their salt intake in the post-survey compared to 41.7% ($p < .001$) in the pre-survey. During the individual counseling, most participants reported not knowing the salt content of their foods (cheese, lunch meat, crackers). During the pre-survey, 16.7% of patients reported using a system to organize their medicine compared to

91.7% ($p = .001$)in the post-survey. This significant increase was due to the medication organizer that each participant received.

Prior to the intervention, only 17% of patients monitored their weight daily compared to 75% ($p < .001$) after the educational intervention. Patients reported being more motivated to check their weight after being provided a scale. For the patients that were unable to check their daily weight due to ambulatory issues, they were instructed on other methods to check for volume overload such as: check their ankles for swelling, check for shortness of breath while performing ADL's, monitor their symptoms and know their baseline. After completing the self-care management program, self-care maintenance increased to 29%, self-care perception increased to 39%, self-care management increased to 26%, and self-care confidence increased to 22%. The homebound heart failure program effectively improved self-care behavior scores in heart failure patients.

Heart failure patients must have the motivation to learn, and the confidence to perform self-care activities. After the intervention, participants reported more confidence in their ability to follow the treatment plan and manage their symptoms at home. One factor that may have influenced these results was the individual counseling and the reinforcement of heart failure self-care education. All of the participants required assistance from a caregiver. The protocol for this quality improvement project did not include the caregiver participation. The majority of the patients were disabled and required assistance with performing ADL's and following their treatment plan at home. Future programs of study should focus on providing educational interventions for both the patients and their caregivers for optimal results.

Bivariate analysis indicated that self-care maintenance, self-care perception, self-care management, and self-care confidence increased from pretest to posttest at a statistically significant level. This finding suggests that heart failure self-care behaviors improved after the self-care management program. Preexisting diagnoses of anxiety and depression were collected and included in the demographic data. Participants provided yes or no answers to whether they have ever been diagnosed, or treated, for anxiety and depression. The independent samples t-test of pretest to posttest difference scores by history of anxiety and depression did not differ significantly across the self-care maintenance (p <.01), self-care perception (p <.01), self-care management (p <.01) , and self-care confidence (p <.01) subscale of the SCHFI questionnaire. Anxiety and depression may affect readiness and motivation to learn. Future studies should measure anxiety and depression in participants by using standardized tools such as the Patient Health Questionnaire Anxiety-Depression Scale (PHQ-ADS). This instrument combines the PHQ-9 and the General Anxiety Disorder (GAD) scales to obtain a composite measurement of anxiety and depression. In three previous clinical trials, the PHQ-ADS demonstrated high internal reliability (Cronbach's alpha 0.8 to 0.9). Additionally, the scale demonstrated strong convergent and construct validity when evaluating its association with other mental health, quality of life, and disability instruments (Kroenke et al., 2016).

Cognitive impairment is very common amongst older adult heart failure patients. The presence of cognitive deficits interferes with self-care activities, and the ability to recognize and manage symptoms. Furthermore, cognitive deficits lead to increased mortality, higher rates of hospital readmissions, increased healthcare utilization, decreased functional status, and poor quality of life (Leto & Feola, 2014). All 11 participants in the self-care

management program were able to communicate without any difficulties as well as recall and retain information. No cognitive deficits were identified amongst participants. Clark et al. (2015) conducted a study which measured cognitive abilities by using the MMSE and the MIA questionnaire. Future programs of study on older adult heart failure patients should utilize these instruments to assess for potential cognitive deficits that may prevent patient engagement in self-care activities.

There was a risk for provider bias since the nurse practitioner operated as both primary care provider and primary investigator. To minimize bias, the self-care management program and the routine homecare visits were not conducted on the same day. Eleven participants completed the study. No hospitalizations due to heart failure occurred during the implementation phase.

The project was implemented in low-income and underserved neighborhoods with pre-existing food deserts. Participants were either Medicare or Medicaid recipients. The goal was to provide each participant with a $20 food voucher towards fruits and vegetables which can be redeemed at their local supermarket. However, customer service personnel from the local supermarket stated that State dietary regulations prevented them from telling customers what food they can purchase. Therefore, each participant received a $20 visa gift card to purchase fresh fruits and vegetables. The United States Department of Agriculture has a Farmers Market Nutritional Program for low income seniors and Women, Infants, and Children (WIC) recipients. Under this program, eligible residents are able to receive four $5.00 vouchers to purchase fresh, unprepared, locally grown fruits, vegetables, and herbs from approved farmers in Pennsylvania. There are over 53 participating farmers

market and farm stands throughout Philadelphia County (Pennsylvania Department of Agriculture, 2020). This program is a great resource for low income and senior residents. Adding delivery services for homebound and disabled patients would greatly increase the access to nutritional foods. A change in policy is required to address the needs of impoverished neighborhoods with no local farmers market. In those areas, patients should be provided with vouchers to purchase fresh fruits and vegetables from the local supermarket.

Theoretical Model

The findings of the heart failure quality improvement project were consistent with the Situation-Specific Theory of Heart Failure Self-Care. The theory emphasizes that self-care is a naturalistic decision-making process. Patients will make decisions based on knowledge, experience, and available resources. Self-care management programs can empower patients to make healthy choices through educational reinforcement, counseling, and social support. After providing participants with the blood pressure monitors and the weight scales, they were more motivated to participate in self-care activities. Some participants reported not increasing their activity because of chronic pain and difficulty walking for prolonged periods. Although, after reviewing the idea of modified exercises and providing referrals for physical therapy, they were more willing to increase their activity. The common theme amongst participants was that perceived barriers and lack of knowledge prevents self-care actions. Overall, patients need knowledge, resources, and provider support to engage in daily self-care decision making.

Implications for Practice, Education, Policy, and Research

There are multiple implications for nursing practice. Data integrity in the EMR must be maintained to provide accurate, up-to-date, and complete patient information. A high-quality EMR can improve organizational efficiency, productivity, enhanced security and privacy of data, and profitability (HealthIT.gov, 2019). A nurse informaticist should be consulted to address any usability issues and streamline the clinical workflow. Consistent documentation of patient education and interventions in the EMR by the APRN will make the contributions of the nursing role more visible. The allotted time for homecare visits are 30 minutes for established patients. A longer time frame is needed to allow for patient education and counseling. The final implication for nursing practice is to provide comprehensive coordinated care through interprofessional collaboration.

The COVID-19 pandemic had a significant impact on the full implementation of this project. Patient home visits and individual counseling were limited due to social distancing and infection control policies. This incidence highlights the need for full implementation of telemedicine to continually provide quality care. The main issue with telemedicine in this population is access to the internet, ability to interact with technology, or lack of technological devices.

Blood pressure and heart rate monitoring at home has the potential to reduce hospital readmissions by tracking physiologic changes to identify early deterioration. At the beginning of the self-care management program, each participant was provided with a blood pressure monitor. During the weekly follow-up telephone calls, participants reported monitoring their blood pressure at least twice per day. Purchasing a blood pressure cuff may be a financial hardship for low-income or patients with fixed income. Current

insurance and healthcare policies does not mandate that heart failure patients receive a blood pressure cuff, although, the recommendations are for patients to routinely monitor and track their blood pressures at home (White, Kirschner, and Hamilton 2014). CMS regulations will provide Medicare recipients with an Ambulatory Blood Pressure Monitoring (ABPM) device once per year under two specific criteria: beneficiaries with suspected white coat hypertension or masked hypertension. White coat hypertension is defined as: an average systolic blood pressure greater than 130 mm Hg but less than 160 mm Hg or a diastolic blood pressure greater than 80 mm Hg but less than 100 mm Hg. These measurements must be observed on two separate office/clinic visits with a least two separate measurements made at each visit. Two blood pressure measurements taken outside of the office must be less than 130/80 (CMS, 2019). Masked hypertension is defined as: systolic blood pressure between 120 mm Hg and 129 mm Hg or diastolic between 75 mm Hg ang 79 mm Hg on two separate clinic/office visits with at least two separate measurements made at each visit. Two separate blood pressure measurements taken outside of the office should be greater than 130/80 (CMS, 2019). Additionally, Medicare will provide patients receiving dialysis treatments at home with a blood pressure cuff and a stethoscope (CMS, 2019).

Patients diagnosed with heart failure should be provided with an ABPM or blood pressure cuff to improve health outcomes and improve self-care ability as well as confidence. A change in this policy may reduce 30-day rehospitalization rates and decrease emergency room visits by allowing primary care providers to identify early signs of clinical deterioration and provide timely interventions.

The complexity of heart failure management requires interprofessional collaboration to improve the patient care experience and provide efficient quality care. The National League for Nursing, National Academy of Medicine, and the American Association of Colleges of Nursing support the implementation of an Interprofessional Education (IPE) model in nursing curriculum before students enter the workforce (Gunnel, Madsen, and Foley, 2016). Gunnel et al. (2016) suggest integrating IPE through simulation. This process allows nursing students to work and communicate with other health professions in a safe setting with no risk to patient safety. IPE simulation can promote positive attitudes, mutual respect, and new insight amongst the various disciplines. To prepare students and new graduates to function in an interdisciplinary team, simulation should be implemented in all nursing and health professions curricula. Educational leaders, administrators, and stakeholders should provide adequate resources such as: personnel, equipment, simulation labs, and faculty training to support IPE simulation (Gunnel et al., 2016).

Study Limitations

A total of 11 participants completed the study. This small sample size limits the generability of the study. The self-care management program was implemented over a 6-week period. Patients must adopt self-care management skills into their daily routine, which requires ongoing education, reinforcement, and follow-up for more than 6 weeks. Other studies of homebased patients were implemented over 6 months (Bryant & Gaspar, 2014; Bryant and Himawan, 2019). This project did not collect marital status or level of education data. This information can be helpful when designing and implementing individualized patient treatment plans.

Future Research

Future implementation of evidence-based practice should be conducted with a larger sample size and a longer time frame for implementation. In older and disabled patients, the caregiver and family members should always be involved in the patient's education and treatment plan. Future programs of study should also be conducted on the contributions of the caregiver. The 30-day hospital readmission rates were not addressed in this project. Due to the tremendous financial impact on the healthcare system, future work should focus on the impact of self-care management programs on 30-day readmission and mortality rates

Conclusion

This self-care management program effectively improved self-care behaviors. Heart failure patients require ongoing educational reinforcement and provider support to manage their symptoms at home. The results of the project were shared with the homecare manager and other healthcare providers, including a plan for sustainability. Moving forward, the following practice changes will be implemented: 1) homebound heart failure patients will receive an educational packet along with individual counseling, 2) the EMR will be updated to reflect the current practice load, 3) healthcare providers will continue to document educational interventions in the EMR, and 4) efforts will be made to track 30-day hospitalization and mortality rates for heart failure patients.

Homebound heart failure patients have an increased risk for adverse events due to comorbidities, polypharmacy, older age, low health literacy, and poor socioeconomic status. A standardized heart failure educational program has the potential to eliminate racial and health disparities amongst this population. Also, addressing the mental, social, and physical

barriers preventing self-care through interprofessional referral and collaboration will improve health outcomes for heart failure patients.

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Table 1.

Sample Excel Demographic Report

Identifier Year of birth and mother/father first initial	**Age**	**Gender**	**Race**	**NYHA Class**	**# of Comorbidities**
1982WV	81	F	AA	IV	3

Table 2

Sample Excel Telephone Follow-up

Identifier	Telephone Follow-up	Date	Time			
1982WV						

Table 3

DNP Project Expenses

Supplies	Unit Purchased	Cost Per Unit	Total
Heart Failure Booklet	50		$236.27
SPSS Program 1-Year Rental	1	$99.00	$99.00
Brother's Black Ink Cartridge	1	$12.49	$12.49
Wrist Blood Pressure Cuffs	20	$21.99	$465.10
Upper Arm Blood Pressure Cuffs	30	$26.95	$855.60
Box of Pens (60)	1	$3.75	$3.75
Two Pocket Red Folders	50		$25.42
Reusable Bags	60		$89.97
Writing Pads	48		$51.80
Pill Boxes	27	$3.98	$107.46
Weight Scales	30	$11.99	$387.00
Copies (Consents/Surveys)			$44.50
CITI Training for NP Data Collector			$129.00
Statistician			$1,760.00
NP Home Visit Staff for 8 patients			$500
File Cabinet and Stapler from Staples			$22.67
Gift Cards plus activation fee	$25	11	$275.00
Total			$5064.98

Table 4

DNP Project Timeline

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
-Complete chart audits -Contact potential participants -Schedule first homecare visit with participants -Meet with shareholders -Meet with statistician -Meet with faculty mentor -Inventory of supplies	-Complete first home visit. -Obtained consent -Participants complete baseline SCHFI scale -Provide educational counseling -Provide participants with scale, blood pressure monitor, pill box, and heart failure booklet.	-Meet with statistician -Meet with shareholder and faculty mentor -Complete 1st telephone follow-up -Enter results of baseline SCHFI into the SPSS program	-Meet with shareholder and faculty mentor -Complete 2nd telephone follow-up -Continue with data entry	-Meet with shareholder and faculty mentor -Complete 3rd telephone follow-up -Continue with data entry	- Meet with shareholder and faculty mentor -Complete 4th telephone follow-up -Continue with data entry	- Meet with shareholder and faculty mentor -Complete final home visit -Complete post intervention SCHFI scale -Provide participants with $20 gift cards - Meet with statistician - Continue with data entry

Table 5

Descriptive Analysis of Study Participant Demographic Characteristics ***(n=11)***

Variable	**N**	**%**
Gender		
Male	5	45.5
Female	6	54.5
Race/Ethnicity		
Black	8	72.7
White	1	9.1
Hispanic	2	18.2
Age	11	*M*=72.55, *SD*=11.78, MIN/MAX=56-89
History of Anxiety		
Yes	6	54.5
No	5	45.5
History of Depression		
Yes	8	72.7
No	3	27.3
NYHA Functional Class		
3	8	72.7
4	3	27.3
Comorbidity		
5	1	9.1
9	4	36.4
10	1	9.1
12	2	18.2
14	1	9.1
15	1	9.1
17	1	0.0

Table 6

Descriptive Analysis of Pretest to Posttest Difference Scores (n=11)

Variable	**M (SD)**	**Maximum**	**Skew (SE)**	**Kurtosis (SE)**
Self-Care Confidence Diff. Score	11.27 (8.68)	0.00-29.00	.48 (.66)	.23 (1.28)
Self-Care Management Diff. Score	10.73 (4.63)	1.00-19.00	-.43 (.66)	1.49 (1.28)
Self-Care Perception Diff. Score	17.00 (9.76)	6.00-31.00	.35 (.66)	-1.76 (1.28)
Self-Care Maintenance Diff. Score	12.91 (7.80)	2.00-31.00	1.01(.66)	2.14 (1.28)
Total SCHFI Diff. Score	51.91 (26.14)	13.00-97.00	.04 (.66)	-.95 (1.28)

Table 7

Paired Samples T-Test Analysis of Pretest to Posttest Change in Scores (n=11)

Timepoint	n	M (SD)	t(df)	p	Cohen's *d*
Self-Care Confidence			**-4.31 (10)**	**.002**	**-1.50[1]**
Pretest	11	36.27 (10.00)			
Posttest	11	47.55 (3.56)			
Self-Care Management			**-7.69 (10)**	**.001**	**-3.22[1]**
Pretest	11	27.27 (4.47)			
Posttest	11	38.00 (1.48)			
Self-Care Perception			**-5.78 (10)**	**.001**	**-2.05[1]**
Pretest	11	35.18 (11.40)			
Posttest	11	52.18 (2.82)			
Self-Care Maintenance			**-5.49 (10)**	**.001**	**-2.09**
Pretest	11	31.55 (7.75)			
Posttest	11	44.45 (4.06)			
Total SCHFI			**-6.59 (10)**	**.001**	**-2.43[1]**
Pretest	11	130.27 (29.23)			
Posttest	11	182.18 (7.49)			

[1]A Cohen's *d* of 0.8 or greater is considered a 'large' effect size

Table 8

Pearson's r Correlation Between Age and Pre/Post Difference Scores (n=11)

Variable	**1**	**2**	**3**	**4**	**5**	**6**
1. Age	--	-.56	-.55	-.20	-.70*	-.57
2. Self-Care Confidence Diff. Score		--	.44	.54	.66*	.81**
3. Self-Care Management Diff. Score			--	.61*	.72*	.76**
4. Self-Care Perception Diff. Score				--	.70*	.87**
5. Self-Care Maintenance Diff. Score					--	.91**
6. Total SCHFI Diff. Score						--

*p<.05, **p<.01.

Table 9

Independent Samples T-Test Analysis of Pretest to Posttest Difference Scores by Gender (n=11)

Variable	Male (n=5) M (SD)	Female (n=6) M (SD)	t(df)	p
Self-Care Confidence Diff. Score	8.20 (6.50)	13.83 (9.99)	-1.08 (9)	.31
Self-Care Management Diff. Score	10.40 (6.84)	11.00 (2.28)	-.20 (9)	.84
Self-Care Perception Diff. Score	17.00 (11.60)	17.00 (9.10)	.00 (9)	1.00
Self-Care Maintenance Diff. Score	14.40 (10.88)	11.67 (4.80)	.56 (9)	.59
Total SCHFI Diff. Score	50.00 (33.34)	53.50 (21.70)	-.21 (9)	.84

Table 10

Independent Samples T-Test Analysis of Pretest to Posttest Difference Scores by Racial Identity (n=11)

Variable	Black (n=8) M (SD)	Other (n=3) M (SD)	t(df)	p
Self-Care Confidence Diff. Score	9.75 (6.48)	15.33 (14.01)	-.95 (9)	.37
Self-Care Management Diff. Score	10.88 (2.70)	10.33 (9.02)	.16 (9)	.87
Self-Care Perception Diff. Score	16.50 (9.90)	18.33 (11.37)	-.26 (9)	.80
Self-Care Maintenance Diff. Score	11.50 (4.31)	16.67 (14.50)	-.98 (9)	.36
Total SCHFI Diff. Score	48.63 (19.99)	60.67 (43.13)	-.66 (9)	.53

Table 11

Independent Samples T-Test Analysis of Pretest to Posttest Difference Scores by History of Anxiety (Yes/No) (n=11)

Variable	Yes (n=6) M (SD)	No (n=5) M (SD)	t(df)	p
Self-Care Confidence Diff. Score	10.67 (10.91)	12.00 (6.20)	-.24 (9)	.82
Self-Care Management Diff. Score	10.83 (5.95)	10.60 (3.05)	.08 (9)	.94
Self-Care Perception Diff. Score	16.33 (10.65)	17.80 (9.73)	-.24 (9)	.82
Self-Care Maintenance Diff. Score	13.00 (10.68)	12.80 (3.11)	.04 (9)	.97
Total SCHFI Diff. Score	50.83 (33.61)	53.20 (17.12)	.14 (9)	.89

Table 12

Independent Samples T-Test Analysis of Pretest to Posttest Difference Scores by History of Depression (Yes/No) (n=11)

Variable	Yes (n=8) M (SD)	No (n=3) M (SD)	t(df)	p
Self-Care Confidence Diff. Score	12.13 (9.61)	9.00 (6.56)	.51 (9)	.62
Self-Care Management Diff. Score	10.88 (5.28)	10.33 (3.06)	.16 (9)	.87
Self-Care Perception Diff. Score	18.00 (10.04)	14.33 (10.40)	.54 (9)	.61
Self-Care Maintenance Diff. Score	13.38 (9.09)	11.67 (3.51)	.31 (9)	.77
Total SCHFI Diff. Score	54.38 (29.27)	45.33 (18.15)	.49 (9)	.64

Table 13

Repeated Measures General Linear Model Examining Pretest to Posttest Self-Care Maintenance Score Changes While Controlling for the Effect of Study Participant Age (n=11)

Timepoint	**n**	**M (SD)**	**F(df)**	**p**	**PES[1]**
			16.27 (1, 9)	**.02**	**.64**
Pretest	11	31.55 (7.75)			
Posttest	11	44.45 (4.06)			

[1]Partial Eta Squared Effect Size of .64 is a large effect

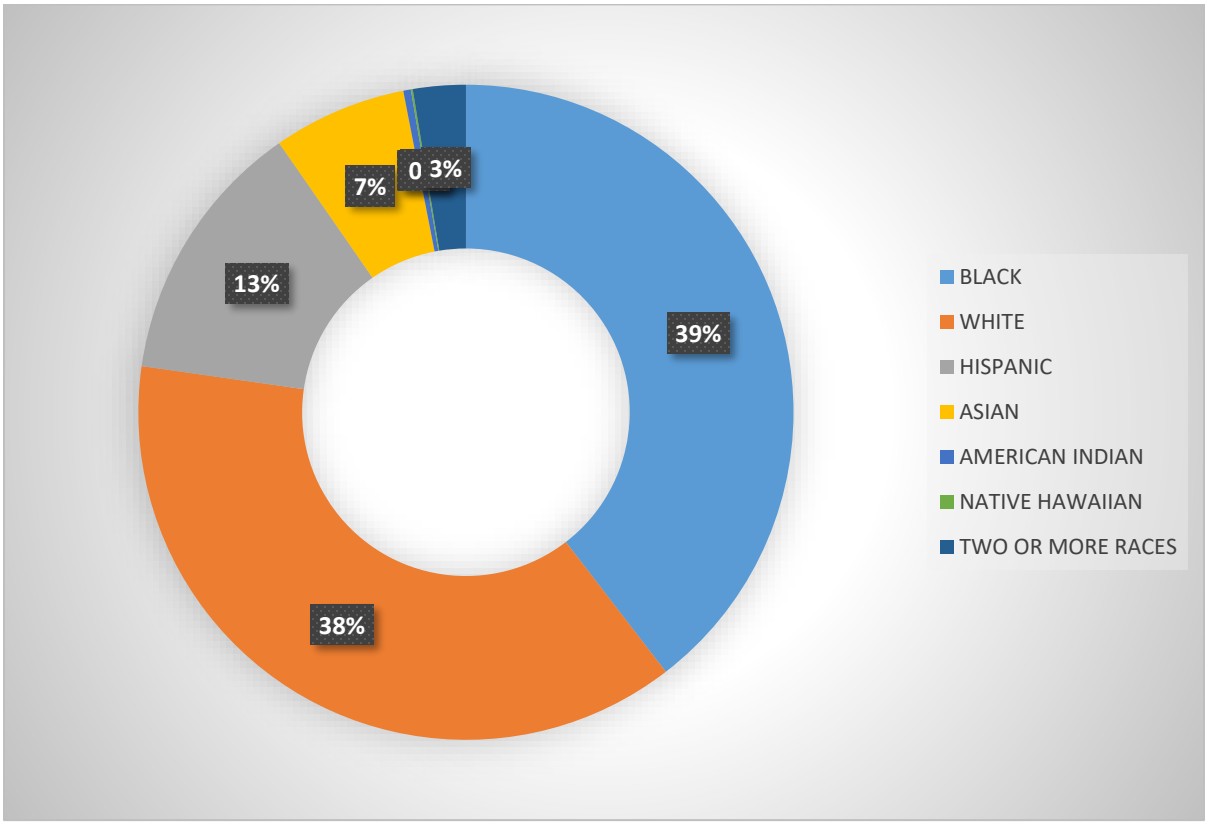

Figure 1._This figure represents the ethnic diversity of Philadelphia county. Adapted from https://www.towncharts.com/Pennsylvania/Demographics/Philadelphia-city-PA-Demographics-data.html

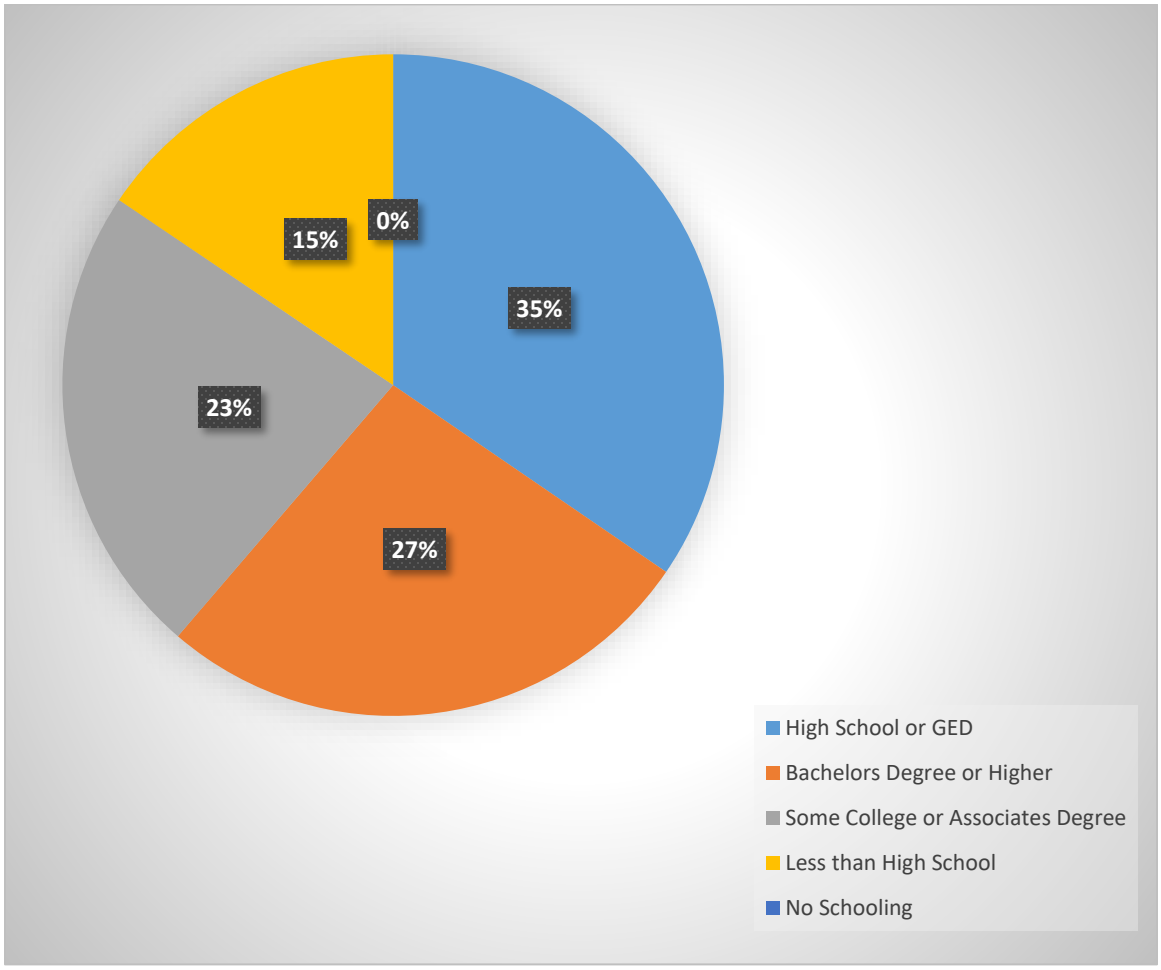

Figure 2. Philadelphia educational attainment for individuals 25 years and older. Figure represents data from the latest 2017 American Community Survey . Adapted from https://www.towncharts.com/Pennsylvania/Education/Philadelphia-city-PA-Education-data.html.

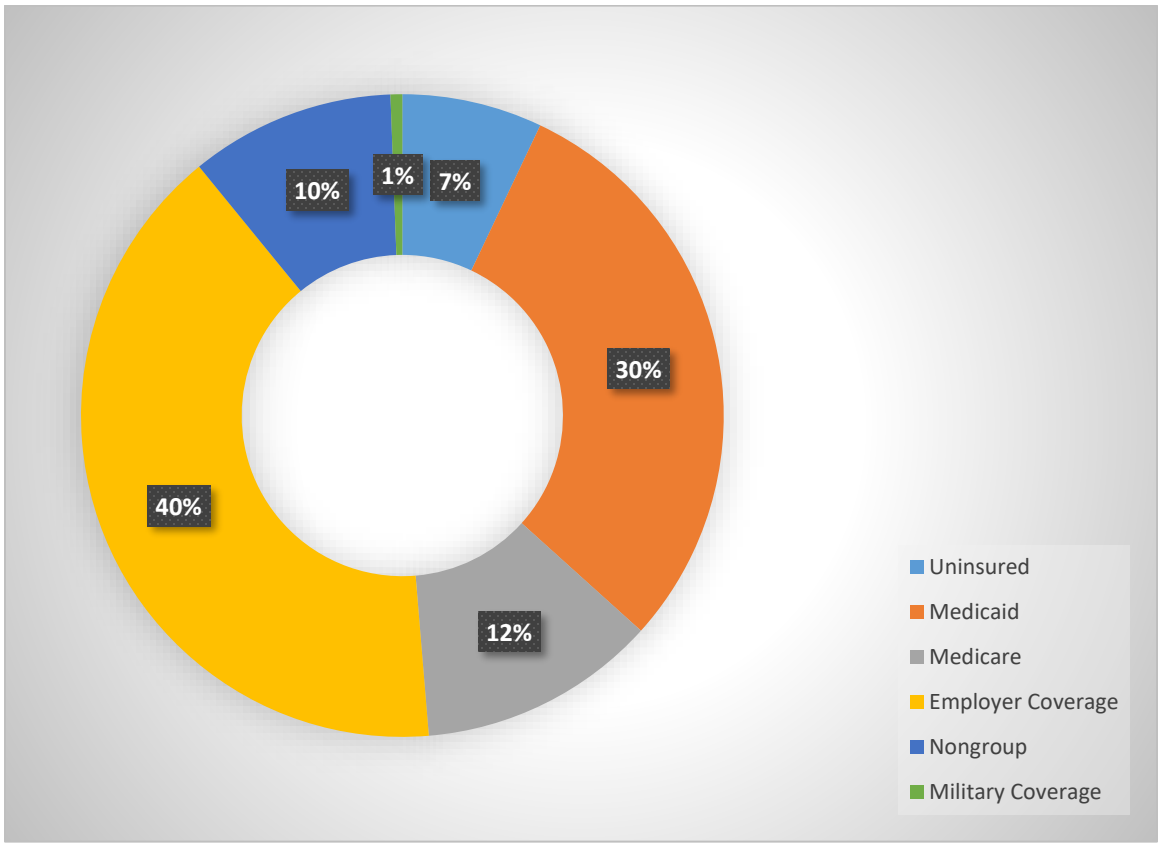

Figure 3. Philadelphia insurance coverage data for adults 18 years of age and older. Adapted from https://www.towncharts.com/Pennsylvania/Healthcare/Philadelphia-city-PA-Healthcare-data.html

Appendix A

Consent Form

Project Title: Heart Failure Self-Care Management Educational Program

Investigator(s): Dinah Warren; Jacquelyn Owens

Project Overview:

Participation in this project is voluntary and is being done by Dinah Warren as part of her Doctoral work. The purpose of the project is to use a heart failure self-care program to improve self-care.

This project will take about 60 minutes to sign the consent form, complete the pre-questionnaire, and receive the educational. After the initial visit, you will receive weekly telephone follow-up calls for 4 weeks to answer any questions. Telephone calls should last about 10 minutes. After 6 weeks, a final home visit will occur to complete the questionnaire. You will receive $20.00 dollars in the form of gift card at the completion of the program. You will also receive heart failure education and learn skills to improve your quality of life and reduce the risk of being admitted to the hospital. You will also receive a heart failure booklet, a weight scale, a blood pressure cuff, and a medication organizer. This project may help to prevent your readmission to the hospital soon after your discharge.

The project is being done by Dinah Warren as part of her Doctoral work. The purpose of the project is to use a heart failure self-care program to improve self-care. If you would like to take part, West Chester University requires that you agree and sign this consent form.

You may ask Dinah Warren any questions to help you understand this project. If you don't want to be a part of this project, it won't affect any care you may receive from Excel Medical. If you choose to be a part of this project, you have the right to change your mind and stop being a part of the project at any time.

1. **What is the purpose of this project?**
    - The purpose of the project is to use a heart failure self-care program to improve self-care.
2. **If you decide to be a part of this project, you will be asked to do the following:**
    - sign this informed consent form
    - complete a questionnaire at the beginning and again at the end of the project
    - accept education
    - review the Krames Living with Heart Failure booklet
    - accept weekly telephone follow-up calls for 4 weeks

    This project will take a total of 2 hours of your time.

3. **Are there any experimental medical treatments?**
    - No
4. **Is there any risk to me?**
    - No
5. **Is there any benefit to me?**
    - Benefits to you may include heart failure education. You will learn self-care skills to improve your quality of life and reduce the risk of returning to the hospital soon after discharge. You will receive education, a heart failure booklet, telephone follow-up, a weight scale, and a medication organizer.
    - Other benefits may include a decreased risk of returning to the hospital within a month after your discharge.

6. **How will you protect my privacy?**
    - The visits will **not** be recorded.
    - Your records will be private. Only Dinah Warren, Jacquelyn Owens, and the IRB will have access to your name and responses.
    - Your name will **not** be used in any reports.
    - Records will be stored:
        - In a locked cabinet in Philadelphia Employee Medical Services Room 1901 Fairmount Avenue. Philadelphia PA 19130
        - In a password protected file/computer
    - Your answers to the survey will not contain your name. All protected health information and your contact information will be kept confidential.
    - Records will be destroyed three years after project completion
7. **Do I get paid to take part in this project?**
    - You get $20.00 dollars in the form of a gift card
8. **Who do I contact in case of research related injury?**

    For any questions with this project, contact:

    - **Primary Investigator:** Dinah Warren at 267-977-6791 or dinahwarren18@gmail.com
    - **Faculty Sponsor:** Jacquelyn Owens at 610-436-2219 or jowens@wcupa.edu
9. **What will you do with my Identifiable Information?**
    - Your information will not be used or distributed for use in future research studies.

For any questions about your rights in this research project, contact the ORSP at 610-436-3557.

I, _____ (your name), have read this form and I understand the statements in this form. I know that if I am uncomfortable with this project, I can stop at any time. I know that it is not possible to know all possible risks in a project, and I think that reasonable safety measures have been taken to decrease any risk.

_____ Date: _____

Subject/Participant Signature

_____ Date: _____

Witness Signature

Appendix B

SELF-CARE OF HEART FAILURE INDEX

All answers are confidential.

Think about how you have been feeling in the last month as you complete this survey.

SECTION A:

Listed below are behaviors that people with heart failure use to help themselves. How often or routinely do you do the following?

	Never		Sometimes		*Always*
1. Try to avoid getting sick (e.g., wash your hands)?	1	2	3	4	5
2. Get some exercise (e.g., take a brisk walk, use the stairs)?	1	2	3	4	5
3. Eat a low salt diet?	1	2	3	4	5
4. See your health care provider for routine health care?	1	2	3	4	5
5. Take prescribed medicines without missing a dose?	1	2	3	4	5
6. Order low salt items when eating out?	1	2	3	4	5
7. Make sure to get a flu shot annually?	1	2	3	4	5
8. Ask for low salt foods when visiting family and friends?	1	2	3	4	5
9. Use a system or method to help you remember to take your medicines?	1	2	3	4	5

10. Ask your healthcare provider about your medicines?	1	2	3	4	5

SECTION B:

Listed below are changes that people with heart failure commonly monitor. How often do you do the following?

	Never		Sometimes		*Always*
11. Monitor your weight daily?	1	2	3	4	5
12. Pay attention to changes in how you feel?	1	2	3	4	5
13. Look for medication side-effects?	1	2	3	4	5
14. Notice whether you tire more than usual doing normal activities?	1	2	3	4	5
15. Ask your healthcare provider how you're doing?	1	2	3	4	5
16. Monitor closely for symptoms?	1	2	3	4	5
17. Check your ankles for swelling?	1	2	3	4	5
18. Check for shortness of breath with activity such as bathing and dressing?	1	2	3	4	5
19. Keep a record of symptoms?	1	2	3	4	5

	Have not had symptoms	I did not recognize the symptom	Not Quickly		Somewhat Quickly		Very Quickly
20. How quickly did you recognize that you had symptoms?	N/A	0	1	2	3	4	5
21. How quickly did you know that the symptom was due to heart failure?	N/A	0	1	2	3	4	5

The last time you had symptoms…

(circle **one** number)

	Not Likely		Somewhat Likely		Very Likely
22. Further limit the salt you eat that day?	1	2	3	4	5
23. Reduce your fluid intake?	1	2	3	4	5
24. Take a medicine?	1	2	3	4	5
25. Call your healthcare provider for guidance?	1	2	3	4	5
26. Ask a family member or friend for advice?	1	2	3	4	5
27. Try to figure out why you have symptoms?	1	2	3	4	5

28. Limit your activity until you feel better? 1 2 3 4 5

SECTION C:

Listed below are behaviors that people with heart failure use to control their symptoms. **When you have symptoms, how likely are you to use one of these?**

(circle **one** number for each treatment

Think of a treatment you used the last time you had symptoms… (circle one number)

	I did not do anything	**Not Sure**		**Somewhat Sure**		**Very Sure**
29. Did the treatment you used make you feel better?	0	1	2	3	4	5

Appendix C

Telephone Script

Hello. My name is Dinah Warren . I am nurse practitioner with Excel Medical Center. I am calling to provide you with information on a quality improvement project that is being conducted for heart failure patients. The purpose of the quality improvement project is to determine if a heart failure self-care management program will improve your self-care behaviors. I would like to determine if an educational program will help you learn about heart failure and how to keep yourself healthy at home. You will be asked to complete two questionnaires before and after the educational program. The educational program will be provided during an initial home visit. The second home visit will be to complete the final questionnaire and answer any questions. The project will last approximately 6 weeks. You will also receive weekly telephone calls for 4 weeks to answer any questions and address any concerns. The quality improvement project which includes two home visits, completion of two questionnaires, and 4 weekly follow-up calls will take approximately 2 hours. Your participation is voluntary. You may withdraw at any time. Refusal to participate will not affect

the care you receive from Excel Medical. I will keep all the information that I receive from you by phone, including your name and any other identifying information confidential. You will receive a $20 gift card at the end of the project. After receiving this information, are you interested in participating in the project? If you are interested, can we schedule a home visit?

Appendix D

Office of Research and Sponsored Programs | West Chester University | Wayne Hall
West Chester, PA 19383 | 610-436-3557 | www.wcupa.edu

Protocol ID # 20191209A-R1

TO: Dinah Warren and Cheryl Monturo FROM: Nicole M. Cattano, Ph.D.

Co-Chair, WCU Institutional Review Board (IRB)

DATE: 2/10/2020

Project Title: Heart Failure Self-Care Management Program

Date of Approval for Revision: 2/10/2020**

Please note that the original end date of your approved protocol still applies

☒**Expedited Approval**

This protocol has been approved under the new updated 45 CFR 46 common rule that went into effect January 21, 2019. As a result, this project will not require continuing review. Any revisions to this protocol that are needed will require approval by the WCU IRB. Upon completion of the project, you are expected to submit appropriate closure documentation. Please see www.wcupa.edu/research/irb.aspx for more information.

Any adverse reaction by a research subject is to be reported immediately through the Office of Research and Sponsored Programs via email at irb@wcupa.edu.

Signature:

Co-Chair of WCU IRB

WCU Institutional Review Board (IRB)

IORG#: IORG0004242

IRB#: IRB00005030